THE INVENTION CLAIMED IS:

1. A scanning electron microscope having an inner polepiece, an outer polepiece, an objective lens forming a magnetic lens field leaking onto a surface of a specimen located under lower end surfaces of the polepieces, the objective lens acting to focus an electron beam onto the specimen, a first opening formed in the inner polepiece and located above the lower end surface of the inner polepiece, and a secondary electron detector mounted outside the inner polepiece to detect secondary electrons passed through the first opening,

wherein a negative voltage is applied to the specimen to produce a decelerating electric field near the surface of the specimen to decelerate the electron beam,

wherein there is provided a conversion electrode on which secondary electrons emitted from the specimen impinge, the conversion electrode being mounted around an electron beam passage inside the objective lens, and

wherein secondary electrons emitted from said conversion electrode are guided via said first opening to said secondary electron detector and detected.

2. The scanning electron microscope of claim 1, wherein said conversion electrode is cylindrical and has an inner surface producing secondary electrons at a high efficiency.

3. The scanning electron microscope of claim 2, wherein said inner surface producing secondary electrons at a high efficiency contains a heavy-element material.

4. The scanning electron microscope of claim 1, wherein said conversion electrode is a single cylindrical electrode provided with second openings in portions facing said first openings.

5. The scanning electron microscope of claim 4, wherein a plurality of said first openings are formed in said inner electrode and they are arranged in rotational symmetry about an axis, and wherein a plurality of said second openings are formed in portions of said conversion electrode which face said first openings.

6. The scanning electron microscope of any one of claims 1-3, wherein said conversion electrode is split into two parts located above and below, respectively, said first opening.

7. The scanning electron microscope of claim 1, wherein a negative voltage having an absolute value of less than 3 kV is applied to the specimen.

8. The scanning electron microscope of any one of claims 1-3, wherein an attracting electrode to which a positive potential is applied to attract secondary electrons is mounted near an incident surface of said secondary electron detector, and wherein a potential between a potential at the specimen and the potential at the attracting electrode is applied to said conversion electrode.

9. The scanning electron microscope of claim 8, wherein ground potential is applied to said conversion electrode.

10. The scanning electron microscope of claim 8, wherein a positive or negative potential is applied to said conversion electrode.

11. A method of detecting electrons produced from a specimen in a scanning electron microscope having an inner polepiece, an outer polepiece, an objective lens for producing a magnetic lens field leaking onto a surface of a specimen located below lower end surfaces of the polepieces, a first opening formed in the inner polepiece above the lower end surface of the inner polepiece, and a secondary electron detector for detecting secondary electrons passed through the first opening, said detector being located outside said inner polepiece, said objective lens acting to focus an electron beam onto the specimen, said method comprising the steps of:

applying a negative potential to the specimen to form a decelerating electric field near the surface of the specimen to decelerate the electron beam;

scanning the specimen with the electron beam under this condition;

confining electrons emitted from the specimen by said magnetic lens field;

causing the confined electrons to move upward into a location where the magnetic lens field is weak;

causing the electrons having relatively high energies to move toward surroundings from said location;

causing the electrons moving toward the surroundings to impinge on a conversion electrode located around an electron beam passage inside said inner polepiece;

guiding secondary electrons having relatively low energies produced from said conversion electrode to said secondary electron detector via said first opening; and

detecting the secondary electrons by said secondary electron detector.